① $\mu = 510$ (claim avg.)

$>$

$n = 200$

$\bar{x} = 560$ (avg.)

$s = 65.2$

T-test

CORE 4 PRACTICE 1

$H_0: \mu = 510$

$H_a: \mu > 510$

$df = 199$

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = 10.845$$

$$P(t > 10.845 \mid df = 199) = 3.93 \times 10^{-22}$$

$$\alpha = 0.01$$

- Reject H_0 b/c p-value of $3.93 \times 10^{-22} < \alpha = 0.01$.
- We have suff. evid. that the true avg. SAT score for CB South is greater than 510 pts.

2) $\bar{x} \pm t^*\left(\frac{s}{\sqrt{n}}\right)$ 95%

$= (550.91, 569.09)$

We are 95% conf. that the true avg. SAT score for CB South is btw. 550.91 and 569.09 pts.

Practice #2

1) $\mu = 7.2$
$n = 50$
$\bar{x} = 9.1$
$s = 0.4$

State

① SRS

② $n \geq 30$ or normal

③ pop $\geq 10n$

Check

① stated

② $50 \geq 30$, normal ✓

③ there are more than 500 hospitals

$H_0: \mu = 7.2$

$H_a: \mu \neq 7.2$

$df = 49$

$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = 33.588$ T-test

$2 \cdot P(t > 33.588) = 1.73 \times 10^{-35}$

$\alpha = 0.05$

- Reject H_0 b/c p-value $< \alpha = 0.05$.
- We have suff. evid. that the true avg. stay @ hospital is not 7.2 days.

2) $\bar{x} \pm t^*\left(s/\sqrt{n}\right) = (8.9863, 9.2137)$

T-Interval

We are 95% conf. that the true avg. stay @ hospitals is btw. 8.9863 and 9.2137 days.

Practice 3

1) $n = 45$
$\bar{x} = 4.62$
$s = 0.92$
$\mu = 5$

State

1) SRS
2) $n \geq 30$ normal
3) pop $\geq 10n$

Check

1) stated
2) $45 \geq 30$
3) there are more than 450 possible locations in the stream

$H_0: \mu = 5$ $\quad\quad$ $df = 44$

$H_a: \mu < 5$

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = -2.77$$

$P(t < -2.77) = 0.0041$

- Reject H_0 b/c p-value $< \alpha = 0.01$
- Suff. evid. that the true contamination level is less than 5 mg.